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<140>

<141>

<160> 16

<170> PatentIn Ver. 2.0

 $\langle 210 \rangle$ 1

<211> 70

<212> PRT

<213> Tomato golden mosaic virus

 $\langle 400 \rangle$ 1

Thr Leu Val Trp Gly Glu Phe Gln Val Asp Gly Arg Ser Ala Arg Gly
1 5 10 15

Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Glu Ala Leu Asn Ala Ser
20 25 30

Ser Lys Glu Glu Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys
35 40 45

Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe
50 55 60

Asp Lys Thr Pro Glu Pro
65 70

 $\langle 210 \rangle$ 2

<211> 70

<212> PRT

<213> Tomato golden mosaic virus

 $\langle 220 \rangle$

<223> Description of Artificial Sequence: Fragment of TGMV Rep protein (aa 110-179) with alanine replacement (RS-R125).

 $\langle 400 \rangle$ 2

Thr Leu Val Trp Gly Glu Phe Gln Val Asp Gly Ala Ala Ala Ala Gly
1 5 10 15

Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Glu Ala Leu Asn Ala Ser
20 25 30

Ser Lys Glu Glu Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys
35 40 45

Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe
50 55 60

Asp Lys Thr Pro Glu Pro
65 70

<210> 3
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<212> PRT
<213> Tomato golden mosaic virus

<220>
<223> Description of Artificial Sequence: Fragment of
TGMV Rep protein (aa 110-179) with alanine
replacements (E--N140 + KEE146)

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Thr Leu Val Trp Gly Glu Phe Gln Val Asp Gly Arg Ser Ala Arg Gly
1 5 10 15

Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Ala Leu Ala Ala Ser
20 25 30

Ser Ala Ala Ala Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys
35 40 45

Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe
50 55 60

Asp Lys Thr Pro Glu Pro
65 70

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<213> Tomato golden mosaic virus

<220>
<223> Description of Artificial Sequence: Fragment of
TGMV Rep protein (aa110-179) with alanine
replacements (REK154)

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Thr Leu Val Trp Gly Glu Phe Gln Val Asp Gly Arg Ser Ala Arg Gly
1 5 10 15

Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Glu Ala Leu Asn Ala Ser
20 25 30

Ser Lys Glu Glu Ala Leu Gln Ile Ile Ala Ala Ala Ile Pro Glu Lys
35 40 45

Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe

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Asp Lys Thr Pro Glu Pro
65 70

<210> 5

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<212> PRT

<213> Tomato golden mosaic virus

<220>

<223> Description of Artificial Sequence: Fragment of
TGMV Rep protein (aa 110-179) with alanine
replacements (EKY159)

<400> 5

Thr Leu Val Trp Gly Glu Phe Gln Val Asp Gly Arg Ser Ala Arg Gly
1 5 10 15

Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Glu Ala Leu Asn Ala Ser
20 25 30

Ser Lys Glu Glu Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Ala Ala
35 40 45

Ala Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe
50 55 60

Asp Lys Thr Pro Glu Pro
65 70

<210> 6

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<213> Tomato golden mosaic virus

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<223> Description of Artificial Sequence: Fragment of
TGMV Rep protein (aa110-179) with alanine
replacements (Q-HN165)

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1 5 10 15

Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Glu Ala Leu Asn Ala Ser
20 25 30

Ser Lys Glu Glu Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys
35 40 45

Tyr Leu Phe Ala Phe Ala Ala Leu Asn Ser Asn Leu Asp Arg Ile Phe
50 55 60

Asp Lys Thr Pro Glu Pro
65 70

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<213> Tomato golden mosaic virus

<220>
<223> Description of Artificial Sequence: Fragment of
TGMV Rep protein (aa110-179) with alanine
replacements (N-DR172)

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1 5 10 15
Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Glu Ala Leu Asn Ala Ser
20 25 30
Ser Lys Glu Glu Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys
35 40 45
Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Ala Leu Ala Ala Ile Phe
50 55 60
Asp Lys Thr Pro Glu Pro
65 70

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<213> Tomato golden mosaic virus

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<223> Description of Artificial Sequence: Fragment of
TGMV Rep protein (aa 110-179) with alanine
replacements (FQ118)

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1 5 10 15
Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Glu Ala Leu Asn Ala Ser
20 25 30
Ser Lys Glu Glu Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys
35 40 45
Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe
50 55 60
Asp Lys Thr Pro Glu Pro
65 70

<210> 9
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<220>
 <223> Description of Artificial Sequence: Fragment of
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 1 5 10 15
 Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Glu Ala Leu Asn Ala Ser
 20 25 30
 Ser Lys Glu Glu Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys
 35 40 45
 Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe
 50 55 60
 Asp Lys Thr Pro Glu Pro
 65 70

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 <223> Description of Artificial Sequence: Fragment of
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 20 25 30
 Ser Lys Glu Glu Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys
 35 40 45
 Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe
 50 55 60
 Asp Lys Thr Pro Glu Pro
 65 70

<400> 11

Thr Tyr Pro Gln Cys Ser Leu Ser Lys Glu Glu Ser Leu Ser Gln Leu
20 25 30

Glu Leu His Glu Asp Gly Gln Pro His Leu His Val Leu Ile Gln Phe
50 55 60

Glu Gly Lys Tyr Cys Cys Gln Asn Gln Arg Phe Phe Asp Leu Val Ser
65 70 75 80

Pro Thr Arg Ser Ala His Phe His Pro Asn Ile Gln Arg Ala Lys Ser
85 90 95

Ser Ser Asp Val Lys Thr Tyr Ile Asp Lys Asp Gly Asp Thr Leu Val
100 105 110

Trp Gly Glu Phe Gln Val Asp Gly Arg Ser Ala Arg Gly Gly Cys Gln
115 120 125

Thr Ser Asn Asp Ala Ala Ala Glu Ala Leu Asn Ala Ser Ser Lys Glu
130 135 140

Glu Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys Tyr Leu Phe
145 150 155 160

Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe Asp Lys Thr
165 170 175

Pro Glu Pro Trp Leu Pro Pro Phe His Val Ser Ser Phe Thr Asn Val
180 185 190

Pro Asp Glu Met Arg Gln Trp Ala Glu Asn Tyr Phe Gly Lys Ser Ser
195 200 205

Ala Ala Arg Pro Glu Arg Pro Ile Ser Ile Ile Ile Glu Gly Asp Ser
210 215 220

Arg Thr Gly Lys Thr Met Trp Ala Arg Ser Leu Gly Pro His Asn Tyr
225 230 235 240

Leu Ser Gly His Leu Asp Leu Asn Ser Arg Val Tyr Ser Asn Lys Val
245 250 255

Glu Tyr Asn Val Ile Asp Asp Val Thr Pro Gln Tyr Leu Lys Leu Lys
260 265 270

Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe
50 55 60

Asp Lys Thr Pro Glu Pro
65 70

<210> 14
<211> 70
<212> PRT
<213> Tomato golden mosaic virus

<400> 14
Thr Leu Val Trp Gly Glu Phe Gln Val Asp Gly Arg Ser Ala Arg Gly
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Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Ala Leu Ala Ala Ser
20 25 30

Ser Lys Glu Glu Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys
35 40 45

Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe
50 55 60

Asp Lys Thr Pro Glu Pro
65 70

<210> 15
<211> 70
<212> PRT
<213> Tomato golden mosaic virus

<400> 15
Thr Leu Val Trp Gly Glu Phe Gln Val Asp Gly Arg Ser Ala Arg Gly
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Gly Cys Gln Thr Ser Asn Asp Ala Ala Ala Glu Ala Leu Asn Ala Ser
20 25 30

Ser Ala Ala Ala Ala Leu Gln Ile Ile Arg Glu Lys Ile Pro Glu Lys
35 40 45

Tyr Leu Phe Gln Phe His Asn Leu Asn Ser Asn Leu Asp Arg Ile Phe
50 55 60

Asp Lys Thr Pro Glu Pro
65 70

<210> 16
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